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The
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Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extension.

T. Todd Johnson

Commissioner of Patents and Trademarks

Ollie M. Person
Attest



US006018954A

United States Patent [19][11] **Patent Number:** **6,018,954****Assaf**[45] **Date of Patent:** **Feb. 1, 2000****[54] HEAT PUMP SYSTEM AND METHOD FOR AIR-CONDITIONING**[76] **Inventor:** **Gad Assaf**, 5 Kosover St., Rehovot
76408, Israel[21] **Appl. No.:** **08/973,090**[22] **PCT Filed:** **Apr. 9, 1996**[86] **PCT No.:** **PCT/US96/04935**§ 371 Date: **Mar. 17, 1998**§ 102(e) Date: **Mar. 17, 1998**[87] **PCT Pub. No.:** **WO96/33378****PCT Pub. Date: Oct. 24, 1996****[30] Foreign Application Priority Data**

Apr. 20, 1995 [IL] Israel 113446

[51] **Int. Cl.⁷** **F25D 17/06**[52] **U.S. Cl.** **62/94; 62/332; 62/271;**
62/305; 62/310[58] **Field of Search** **62/91, 92, 93,**
62/94, 332, 335, 271, 305, 310**[56] References Cited****U.S. PATENT DOCUMENTS**

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Primary Examiner—William Doerrler*Attorney, Agent, or Firm*—Bachman & LaPointe, P.C.**[57] ABSTRACT**

There is provided a heat pump system including two (4, 6), at least similar units in fluid communication with each other, each unit having a housing (8, 8'), a first air/brine heat exchanger (12, 12'), a second brine/refrigerant heat exchanger (24, 24'), a brine inlet (10, 10') for applying brine onto at least one of the heat exchangers, a brine reservoir (14, 14') and a pump (28) for circulating the brine from the reservoir to the inlet. The first and second heat exchangers are in closed loop fluid communication with each other and have a compressor (44) for circulating a refrigerant there-through in selected directions.

28 Claims, 3 Drawing Sheets